30 years range from 0.3 to 0.8 premature cancer deaths per 100,000 nonsmoking passengers for domestic flights and from 0.2 to 0.6 premature cancer deaths per 100,000 for international flights. The range of estimates was derived from the two cancer risk models mentioned above, and the relatively broad range is due to differences in assumed durations of exposure and the sensitivity of the multistage model to assumptions concerning the age at which exposure begins.

Estimated lifetime lung cancer risks due to ETS exposure for nonsmoking passengers flying 48 hours per year on smoking flights for 40 years are approximately 0.1 premature cancer deaths per 100,000 for both domestic and international flights. Applying these risk estimates to the U.S. flying population results in an estimated 0.24 premature lung cancer deaths per year for domestic flights (that is, approximately 10 premature deaths can be expected every 40 years) and 0.12 premature deaths per year for international flights.

In terms of acute effects based on CO concentrations as a proxy for ETS levels, it is estimated that on one-third of smoking flights about 1 in 8 persons seated in the smoking section would experience irritation due to ETS exposure. Further, it is estimated that on about one-third of domestic smoking flights, ETS levels in the smoking section (based on nicotine concentrations as a proxy) would be sufficiently high to evoke a marked sensory response in the eye and nose of an airliner cabin occupant.

Differential effects of ETS and its constituents on such sensitive populations as asthmatics, children, and persons with ischemic heart disease or other cardiovascular disease could not be estimated.

Cosmic Radiation

Estimated lifetime cancer risks due to cosmic radiation exposure for cabin crew members flying 960 hours per year range from 90 to 1,026 premature deaths per 100,000 individuals flying for 20 years on domestic flights and from 220 to 512 premature deaths per 100,000 individuals flying for 10 years on international flights. The estimates, which

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pertain to cockpit crew members as well as cabin crew members, are lowest for relatively short north-south domestic flights and higher for coast-to-coast flights involving higher altitudes. The highest estimates are for relatively long, circumpolar international flights which also occur at high altitudes.

Estimated lifetime cancer risks due to cosmic radiation exposure for passengers flying 480 hours per year range from 45 to 513 premature deaths per 100,000 individuals flying for 20 years on domestic flights and from 110 to 256 premature deaths per 100,000 individuals flying for 10 years on international flights. Like the above estimates for cabin crew, the range is governed largely by flight altitudes and latitudes. Another concern is the effect of cosmic radiation on a fetus, particularly during the first trimester.

Other Pollutants

The levels of bacteria and fungi measured in the airliner cabin air in this study were found to be below the levels generally thought to pose risk of illness. Because quantitative dose-response information on the health risks of biological aerosols was not available, the evaluation of the concentration data was performed by placing the prevalence of individual genera that were identified in rank order, and comparing the prevalence to biological aerosols in other indoor environments. The levels and genera measured in the cabin environment were similar to or lower than those commonly encountered in indoor environments characterized as "normal."

It was unnecessary to perform a risk assessment for ozone because measured levels on all monitored flights were well below the current FAA and EPA standards.

10.1.3 Mitigation

Among the methods evaluated for reducing risks due to ETS, a total ban on airliner cabin smoking would eliminate ETS exposure in airliner cabins and yield the greatest benefit to flight attendants

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Source: https://www.industrydocuments.ucsf.edu/docs/xmxj0001